

WHAT IS CLAIMED IS:

1 1. A high-vacuum valve comprising
2 a valve body having a flow channel;
3 a composite valve plate disposed within said valve body and movable in a direction
4 transverse to said flow channel between a closed position traversing said flow
5 channel to prevent flow therethrough and an open position sufficiently clearing said
6 flow channel to permit flow therethrough, said composite valve plate comprising:
7 a seal plate;
8 a support block;
9 a resilient connector having a first end affixed to one of said seal plate and said
10 support block and a second end terminating in a chamber in the other of said
11 seal plate and said support block, said resilient connector arranged such that
12 when relaxed said resilient connector exerts an expanding force urging said
13 seal plate and said support block apart;
14 sealing means disposed between said second end of said resilient connector and
15 inner walls of said chamber; and
16 a passageway arranged to supply pressurized fluid to one side of said sealing
17 means to thereby impose across said sealing means a pressure differential
18 that compresses said resilient connector in opposition to said expanding
19 force and thereby urges said seal plate and said support block toward each
20 other; and
21 means for supplying pressurized fluid to said passageway and for releasing pressurized
22 fluid therefrom upon command.

1 2. The high-vacuum valve of claim 1 in which said first end of said
2 resilient connector is affixed to said seal plate and said chamber is in said support block.

1 3. The high-vacuum valve of claim 1 in which said resilient connector
2 comprises a shaft terminating in a coil spring at said second end.

1 4. The high-vacuum valve of claim 2 in which said resilient connector
2 comprises a shaft connecting said first and second ends, said sealing means are defined as
3 first sealing means, and said high-vacuum valve further comprises second sealing means
4 between said shaft and said support block, said second sealing means providing a sliding seal

5 to allow said shaft to move relative to said support block while retaining fluid pressure within
6 said chamber.

1 5. The high-vacuum valve of claim 2 in which said second end of said
2 resilient connector is a cup with a coil spring retained therein and protruding therefrom, and
3 said sealing means is a resilient ring encircling said cup.

1 6. The high-vacuum valve of claim 5 in which said one side of said
2 sealing means is defined as a high-pressure side and the side opposing said high-pressure side
3 is defined as a low-pressure side, and said resilient ring has a groove on said high-pressure
4 side such that closing of said groove allows release any fluid pressure accumulated on said
5 low-pressure side.

1 7. The high-vacuum valve of claim 1 comprising a plurality of said
2 resilient connectors whose first ends are all affixed to one of said seal plate and said support
3 block and whose second ends each terminate in individual chambers in the other of said seal
4 plate and said support block.

1 8. The high-vacuum valve of claim 1 comprising a plurality of said
2 resilient connectors whose first ends are all affixed to said seal plate and whose second ends
3 each terminate in individual chambers in said support block, and sealing means disposed
4 between each of said second ends and the inner walls of each of said chambers.

1 9. The high-vacuum valve of claim 8 in which said passageway is
2 arranged to supply pressurized fluid from a common source to all of said sealing means.

1 10. The high-vacuum valve of claim 1 in which said seal plate is defined
2 as a first seal plate, said resilient connector is defined as a first resilient connector, and said
3 composite valve plate further comprises a second seal plate and a second resilient connector,
4 said first and second resilient connectors joining said first and second seal plates respectively
5 to said support block with said first and second seal plates on opposing sides of said support
6 block.

1 11. The high-vacuum valve of claim 10 in which said first end of said first
2 resilient connector is affixed to said first seal plate, said first end of said second resilient

connector is affixed to said second seal plate, and said second ends of both said first and second resilient connectors terminate in chambers in said support block.

12. The high-vacuum valve of claim 10 comprising a plurality of said first resilient connectors and a plurality of said second resilient connectors, said first ends of each of said plurality of first resilient connectors are affixed to said first seal plate, said first ends of each of said second resilient connector are affixed to said second seal plate, and said second ends of all of said resilient connectors terminate in chambers in said support block.

13. The high-vacuum valve of claim 12 in which said passageway is arranged to supply pressurized fluid from a common source to all of said sealing means.

14. The high-vacuum valve of claim 1 in which said high-vacuum valve is a pendulum valve in which said seal plate is a circular plate at one end of a pivot arm with a pivot axis at the other end of said pivot arm, said composite valve plate being movable by rotation of said pivot arm about said pivot axis.

15. The high-vacuum valve of claim 1 in which said high-vacuum valve is a gate valve in which said seal plate is a circular plate at one end of an extension arm having a longitudinal axis, said composite valve plate being movable by linear movement of said extension arm along said longitudinal axis.

16. The high-vacuum valve of claim 1 in which said high-vacuum valve is a rectangular valve in which said seal plate is a rectangular plate joined to an extension arm having a longitudinal axis, said composite valve plate being movable by linear movement of said extension arm along said longitudinal axis.

17. The high-vacuum valve of claim 12 in which said seal plate is a circular plate, said plurality of first resilient connectors are distributed around the periphery of one side of said circular plate, and said plurality of second resilient connectors are distributed around the periphery of the other side of said circular plate, said first and second pluralities of resilient connectors arranged in alternating configuration.

18. The high-vacuum valve of claim 12 in which said seal plate is a rectangular plate, said plurality of first resilient connectors are distributed around the periphery of one side of said rectangular plate, and said plurality of second resilient

- 4 connectors are distributed around the periphery of the other side of said rectangular plate,
- 5 said first and second pluralities of resilient connectors arranged in alternating configuration.